Wood-Based Biofuels and Pellet Production in Maine

Briefing Prepared By the Maine Department of Conservation

The Department of Conservation has convened an internal working group to research and discuss wood-based biofuels and bioproducts industry in Maine. Our goal is to build upon initiatives already underway and the recent studies conducted by The Margaret Chase Smith Policy Center and Innovative Natural Resource Solutions LLC, all of which recognize the tremendous renewable energy potential of Maine's forest resources. We believe that by supporting and guiding the advancement of this emerging industry, a great service can be provided to the people of Maine in the form of an economically viable and stable heating fuel source.

The November 2007 Margaret Chase Smith Policy Center study stated that due "*to Maine's low population size and abundance of woody biomass, it has the potential to replace a large percentage of its own non-renewable energy use with renewable energy from its forest and become a much more energy self-sufficient state*."

Goals:

→ Reduce Maine's dependence on foreign oil specifically & fossil fuels more generally;

→ Reduce heating costs;

→ Enhance the markets for Maine's forest products; and,

→ Maximize the benefits that the Maine public realizes from the use of our forest resources.

The utilization of wood-based products such pellets and chips can help Maine meet these goals.

Why consider pellets as fuel source for thermal heating?

- Reduce dependence on foreign oil – keep fuel budget expenditures in the local economy.
- Pellets selling for $200/ ton equate in BTU Equivalents to $1.75 / gallon #2 heating oil which is currently over $3.22 / gallon.
- Pellets provide a consistent fuel source:
    - Low moisture content;
    - Low emissions more readily absorbed into the environment - Cleanest burning solid fuel;
    - Sustainable available renewable resource.
- Clean convenient storage, easily distributed and conveyed.
- Low ash content - Generally 3 ounces of ash per 40 lb bag (depends largely on quality of pellet and intensity of burn).
- Considered CO2 neutral (however considerations for the fossil fuel to deliver or the cost to the environment to produce and dispose of the plastic bags which contain the pellets are not made).
- Burning wood to heat homes and offices is the most efficient use of woody biomass when compared to turning it into electricity or bio oils.
- Pellets have the advantage over wood chips in terms of conveyance to the boiler, consistent combustion due to moisture and impurities, and particulate emissions.

Barriers to the "mainstream" energy resources:

- Not as convenient as oil in terms of delivery storage and hands-off consumer use.
- No 24 hour service hotline to call in an emergency – technical assistance is hard to find.
- Product technology has outrun the technology to install and maintain.
- Significant variability in the quality of pellets even when labeled as a premium pellet.

- Currently there is no means of bulk delivery to bulk storage that would allow continuous burn with only 3-4 deliveries per year (compatible with oil deliveries). Handling 40lb bags of pellets is not an option for everyone.
- Additional work is needed to determine the truly available supply of biomass fuel subject to the following constraints:
    - Biological – need to leave enough to support necessary forest ecosystem structures and functions. Also need measures to minimize potential for wood not going to its highest and best use (e.g., use of limbs and tops, not boles).
    - Economic – need to analyze impacts on the pulp and paper industry, biomass to energy facilities, and other users of low grade wood in terms of price and supply. Poyry study may achieve some of this; however, additional work likely will be needed to fully explore potential impacts in Maine.
    - Social – need to ensure that new facilities get on board with chain of custody certification so that fiber supply originates from forests certified as well managed.
- Both pellet and chip boilers will compete for the same pulp quality chips as the paper industry.
- Price of pellets indexed to global market place and oil price **not** to the cost of production.
- Limited market place competition.

The pellet market in Maine:
Europe is 20 years ahead of us in terms of solving the issues or barriers which have kept pellets from going mainstream i.e. bulk delivery, conveyance, combustion, particulates. The demand for pellets in Europe is huge. There are existing pellet manufacturing facilities in North America which only exist to feed the European market.

- Pellets provide economic growth and jobs (manufacture, delivery, maintenance).
- Pellet jobs do not compare to pulp and paper mill jobs;
    - 600 employees / million ton pulp mill;
    - 25 employees / 200,000 green tons pellet manufacturing facility.
- The regions pulp & paper landscape will change in the next 5 - 10 years.
- Pellets, chips and pulp all compete for the same resources.

Existing pellet mills:

- Maine: Two facilities, current capacity 115,000 tons per year, expansions and additions are in the works - Potential of 4-5 new pellet manufacturing facilities in the works.
- NH: One facility, 75,000 tons capacity.
- NY: Five facilities, over 200,000 tons capacity.
- VT: Bagging facility for imported pellets (imported from BC).
- Biobricks: BioPellet LLC looking to build one or two facilities in Maine (currently in CT).
- Woodstone looking to site a biopellet or biobrick facility in Berlin, NH; proposed plant would consume 360,000 tons/year (likely to be scaled back during permitting process).
- Planning is under way to build a massive plant in Duluth's inner harbor to produce 500,000 tons of wood pellets every year to ship to Europe's power plants - at a time when Minnesota utilities are struggling to find enough wood to burn in their own boilers.

There is much momentum in Maine to pursue wood-based biofuels. The State should continue to guide this momentum in a positive and practical direction. Much work has already been done and many of the already underway initiatives should begin to yield results during 2008.

Completed or initiatives currently underway include:

- Preparation of a report in 2006 by Erik Kingsley of Innovative Natural Resource Solutions, on what Maine could do to promote the development of a biofuels/bioproduct industry in Maine, (see recommendations below).
- The University of Maine estimated in their 2007 *Biomass and Biofuels in Maine* report, that "*Maine could meet 18% of its transportation fuel needs through forest residues alone*" and they estimated the "*total sustainable and extractable forest residues are 2.6 million dry tons per year"*.
- Conversion of MFS Masardis district office to pellets an example of possibilities for state facilities.
- Preparation of a road map for converting public facilities to biomass heating by the Biomass Energy Resource Center (BERC).
- The Maine Forest Service RFP issued for feasibility assessment of use of woody biomass boilers in public buildings as a heat or energy source and other uses of underutilized wood products. There is a tremendous opportunity in the conversion of schools, hospitals, prisons, state facilities, and college campuses.
- Fuels for Schools is an initiative designed to help public schools and other public facilities reduce their heating costs while increasing forest health. The program promotes the use of biomass heating systems (biomass boilers) that can burn waste wood from hazardous fuels reduction projects.
- Collection of data on Maine's publically owned boilers and preliminary screening for conversion.
- Developing operational guidelines for biomass harvesting.
- Encouraging national efforts to increase the use of woody biomass; including, among other activities, developing a proposal for a national Fuels for Schools program for the National Association of State Foresters.

What the State can do:

- Develop a public policy strategy for integrating pellet and biofuel production into Maine's existing forest products industry in a way that maximizes the use of Maine's wood resources (this may be wholly or partially accomplished through the Poyry report to be prepared for Maine and the Atlantic provinces).
- Give state funding priority to new public buildings incorporating use of wood (chips, pellets, biodiesel, biogas) for heat.
    - Currently there are 21 new schools in the drawing board phase. Only 2 are considering wood as an alternative fuel source.
    - Currently Leavitt, Dexter, and Thorndike Schools are heated or will be heated with wood chips.
- Initiate a fuels for schools (aka public buildings) including funding to support replacement systems and new systems in public buildings. This could be in the form of a bond issue to promote energy efficiency and replacement systems in public buildings.
- Continue to champion the use of woody biomass for public and private thermal heating needs – State role is to continue to advocate and provide for **demonstration projects**
- Fully fund an updated wood supply analysis to determine the amount of biomass that can be sustainably harvested. Not all of the volume can or should be removed from the forest without compromising other biological, economic and social values. The Maine Forest Service and the University of Maine have submitted a proposal to the Department of Energy. If the DOE proposal is successful, the MFS needs to secure $75,000 for match. If it continues to be unfunded, the MFS needs to secure $250,000.
- Develop and publish spatial analysis showing transportation network (rail, road [interstate, private network where overweight trucks can haul], deep water ports); wood supply (current and projected); electric power transmission net; existing industrial zoning, etc.
- Demonstrate to the industry that Maine is open for business by **pre-permitting sites** or develop expedited permitting process for biofuel plants constructed within or adjacent to existing pulp and paper mills and/or biomass to energy plants.
- Bulk delivery and industrial application need to be grown together. Incentivize bulk distribution.

- Actively seek a pellet boiler and/or stove manufacturer to set up business in Maine.
- Expand solar energy credit to qualifying wood pellet heating installations (25% or $1,250, whichever is less).
- Establish training programs for technicians that rivals the support fossil fuel users receive from their oil companies. This should provide for not only installation, but ongoing maintenance as well.
- Work with the industry to establish standards for the production of pellets and the boiler systems which protect Maine citizens.
- Set up a Maine Citizen tax check off program which puts money into an efficiency program which pays energy savings dividends to contributors (a Maine owned ESCO).

Additional considerations would include:

- Assessment of biomass supply from public lands.
- Identification of Department of Conservation facilities for possible conversion utilizing available biomass from Maine's public lands as the heating sources. End goal being vertical integration.